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Enterprise: *Scientists: *Technology

ABSTRACT

The data in this report are based on information supplied annually by the U.S. Civil Service Commission. A full report containing more detailed information on employment and occupational trends, work activities, and educational characteristics is prepared by the Superintendent of Documents, U.S. Government Printing Office. The mean average salary data, derived from the salary data on Federal white collar workers in October 1973, is presented and discussed. Overall trends seen in Federal scientific and technical personnel in 1973 are discussed and indicate a definite decline. Both graphic and tabulated data are presented. (EB)



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SCIENCE RESOURCES STUDIES HIGHLIGHTS

NATIONAL SCIENCE FOUNDATION • WASHINGTON, D.C. 20550 • OCTOBER 18, 1974 • NSF 74-316

Federal Scientific and Technical Personnel Decline in 1973

- Federal scientists and engineers decreased 3 percent in 1973 and nonprofessional scientific and technical personner declined 6 percent
- The Departments of Defense (OOD) and of Agriculture (USDA) remained the largest employers of scientists and engineers in 1973 despite the greatest year to year decreases over 1972 among all agencies
- Women scientists and engineers in Federal employ improved their average grade level in 1973 over 1972, continuing a trend found since 1966

Overall Trends

The 161 500 Federal civilian scientists and engineers employed in October 1973 were 3 percent below the 166,700 in October 1972. This decrease only the second decrease in these personnel since 1964 when comparable data were first kept, reduced. Federal scientist and engineer employment in 1973 to its lowest level since 1968.

Scientific and engineering support personnel also decreased in 1973 dropping 6,500 below the 111,200 employed a year earlier. This decrease, following several years of decreases and minimal growth, reduced support personnel even below the 110,700 of 1968.

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Occupational Change

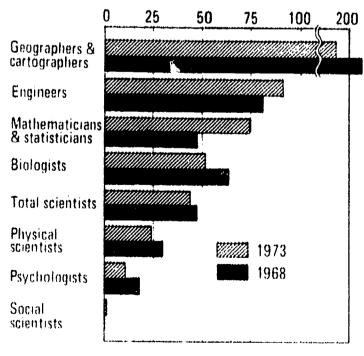
All the major occupational groups of Federal scientists decreased in 1973. Decreases of 4 percent each occurred among the physical and biological scientists, and the geographers, and cartographers, mathematicians and statisticians declined 2 percent, and social scientists were

down 1 percent. The biological scientist (including agricultural scientists) decrease reflected largely comparable decreases among the fields of specialization in this group. For example, forestry declined 4 percent to 5,400 personnel; soil conservation 5 percent to 4,500 personnel; and agricultural management 6 percent to 3,300 personnel. Similarly, among the physical scientists, the large chemist, physicist, and meteorologist series dropped 5 percent, 3 percent, and 4 percent, respectively, to 8,000, 5,600, and 2,200 personnel. General physical scientists remained at 4,400 personnel. The major factor in the geography and cartography decline was

The ratio of Federal nonprofessional scientific and engineering personnel to Federal scientists and engineers by major group and series:

October 1968 and 1973

(S&E support personnel/100 S&E)



SOURCE National Square Foundation from U.S. Civil Service Commission data

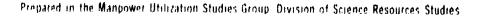


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Source. Nahonal Science Foundation, from U.S. Civid Service Commission data.



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the 3-percent reduction in cartographers—to 2,600 personnel. The mathematician and statistician decrease in 1973 was based largely on a 6-percent decrease in statisticians, 3 percent in mathematicians, and a 4-percent rise in operations researchers. These series in 1973 numbered 2,200, 4,200, and 2,200 personnel, respectively. Economists, who account for well over one-half of the social scientists, remained unchanged at 4,600 personnel.

The 3-percent decrease in Federal engineers in 1973 reflected reductions of 2 percent to 6 percent in almost all major groups and series. Opposite changes were the 4-percent increase in industrial engineers—to 2,400 personnel; and 16 percent and 13 percent each in the very small ceramic and fire prevention engineering series.

The change pattern for nonprofessional scientific groups in 1973 largely mirrored the professional pattern. Biological personnel were down 4 percent, and geography and cartography, and mathematics each declined 6 percent. Engineering support personnel were down 7 percent to 68,200. Physical science personnel, however, advanced 4 percent to 7,900.

The impact of the changes in the scientist and engineer groups relative to their nonprofessional counterparts between 1968 and 1973 is seen in the chart.

Employment by Agency

Changes in Federal scientist and engineer employment between 1972 and 1973 reflect primarily decreases at the largest agencies (table 1). DOD continued as the largest employer, even though employment of such personnel declined 3 percent. USDA remained the second largest employer, but dropped 8 percent. Scientists and engineers at the Department of Health. Education, and Welfare (HEW), and the National Aeronautics and Space Administration (NASA) each declined 4 percent; and at the Department of the Interior they declined 2 percent. On the other hand, scientists and engineers at the Department of Transportation (DOT) increased 2 percent in 1973.

All the major employing agencies reduced their scientific and engineering support staffs in 1973. At Interior such personnel dropped 21 percent; at HEW, 8 percent; at NASA, 7 percent; at the Deaprtment of Commerce, 6 percent; at USDA and DOD, 5 percent; and at DOT, 1 percent. All other agencies combined also decreased in 1973—down 4 percent from the previous year

Salaries of Federal Scientists and Engineers

Federal scientists and engineers received an annual average (mean) salary of \$20.900 in 1973, based on \$20,200 for scientists and \$21,600 for engineers (table 2). The average salary for the 70,800 male scientists was \$20,400, versus \$17,500 for 6,400 females. Women thus received only 86 percent as much as men. Women scientists did best in

psychology, receiving 90 percent as much as males. They compared least favorably with men in the physical sciences, earning only 77 percent as much as men.

Table 2.—Mean annual salaries of Federal scientists and engineers, by selected occupational group and major series, and by sex: October 1973

Occupational group and selected series	Total	Men	Women
Scientists and engineers	\$20 888	\$21.037	\$17512
Scientists:	20.150	20 388	17 501
Physical sciences	21 791	22 110	16.977
Mathematics and statistics	21.272	21 882	18.031
Biological sciences	17 862	17 954	16.043
Social sciences Geography and	21.868	22 508	18 741
cartography	17 469	17 627	15 604
Psychology	22.175	22 484	20 208
Engineers:	21.564	21 586	17.665
C.vil and related	19,970	19.990	16.045
Electrical and electronic	21.067	21.078	18.182
General engineering	24,210	24.229	19.054
Mechanical and related	21.897	21.917	18.552

includes average salary for scientists in all groups and series

Source National Science Foundation, from U.S. Civil Service Commission data

The 500 women engineers averaged \$17,700, or 82 percent of the \$21,600 that 83,800 men earned. The greatest discrepancy in average salary among the major engineering groups was in general engineering where women received only 79 percent of the male average salary. Women faved best in the electrical and electronic engineering group, where their salary was 86 percent of the male average.

The Status of Women Scientists and Engineers

The improvement in the average grade of women scientists and engineers noted between 1966 (the first year grade data

Grade level		Scientists		Engineers		
	1966	1972	1973	1966	1972	1973
to			(per	cent)		
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Grade level	•	Female			Male	
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GS 12 13	24.6	30.6	31.8	43.5	46.0	46.8
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includes average salary for engineers in all groups and series

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were tabulated) and 1972 continued in 1973. The following data compare the grade distributions of total, male, and female scientists and engineers for these years.

Technical Notes

The data in this report are based on information supplied annually by the U.S Civil Service Commission. A full report containing more detailed information on employment and occupational trends, work activities, and educational and other characteristics will be available later this year from the Superintendent of Documents, U.S. Government Printing Office.

The mean average salary data in this report are derived from the salary data on Federal white collar workers in October 1973. In general, the salaries paid to these personnel depend on their grade level and length of service within that grade. (their grade-step). Each position within an occupational series is rated as to grade, and each successively higher grade requires a higher level of duties and responsibilities. For average grade purposes, personnel in ungraded positions are assigned the grade which contains the salary at step 4 nearest the salary they receive